Listing of claims:

Claim 1. (Currently amended )A process for automatically detecting [and precisely handling] exceptions in a sequence of pipelined floating point instructions comprising the steps of:

a) automatically inserting a command that tests for and raises floating point status exceptions into a sequence of instructions to be executed,

b) responding to an exception raised during pipelined execution of the sequence of instructions by returning execution to an instruction in the sequence of instructions at which correct state is known, and

c) executing each instruction in the sequence singly to completion until the exception is again raised.

Claim 2. (Original ) A process as claimed in Claim 1 in which the command is inserted in the sequence after a last floating point instruction and before floating point status is saved.

Claim 3. (Original ) A process as claimed in Claim 2 in which the command is inserted after a branch in the sequence.

Claim 4. (Original ) A process as claimed in Claim 2 in which the command stalls the pipeline if the last floating point instruction has not completed execution when status is to be saved.

Claim 5. (Original ) A process as claimed in Claim 2 in which the command does not stall the pipeline if the last floating point instruction has not completed execution when status is to be saved.

Claim 6. (Original ) A process as claimed in Claim 5 in which floating point status saved is floating point status existing when integer status is saved.

Claim 7. (Original ) A process as claimed in Claim 5 in which floating point status saved is floating point status generated by floating point operations which have completed when integer status is saved.

Claim 8. (Original ) A process as claimed in Claim 1 in which the command compares accumulated condition of exception status detected during execution of the sequence of instructions with armed floating point
exception conditions.

Claim 9. (Original ) A process as claimed in Claim 8 in which the command executes and compares accumulated condition of exception status detected when integer status is saved.

Claim 10. (Original ) A process as claimed in Claim 8 in which the command raises an exception only if newly accrued exceptions have not previously been committed.

Claim 11. (Original ) A process as claimed in Claim 8 in which exception status detected includes exceptions generated by a command for manipulating memory operands used in floating point stack operations.

Claim 12. (Original ) A process as claimed in Claim 11 in which no exception is raised if the corresponding exceptions generated by a command for manipulating memory operands used in floating point stack operations are not armed and have already been reported.

Claim 13. (Currently amended )Apparatus for automatically detecting [and precisely handling] exceptions in pipelined floating point instructions comprising:

a computer-executable software process which automatically inserts commands that test for and raise exceptions indicating floating point status exceptions into a sequence of instructions to be executed during dynamic translation of target instructions,

a computer-executable software process for responding to exceptions by rolling execution of a sequence of instructions back to a point at which correct state is known, and

a computer-executable software process for executing each instruction in the sequence singly to completion until the exception is again raised.

Claim 14. (New) A method for automatically detecting exceptions raised in a sequence of pipelined floating point instructions comprising:

a) automatically inserting into a sequence of floating point instructions to be executed, a command that detects exceptions;

b) detecting an exception raised during pipelined execution of the sequence of floating point instructions by executing the command;

c) returning execution to an instruction in the sequence of floating point instructions at which correct state is known, in response to said detected exception; and

d) identifying an instruction causing the detected exception by executing each instruction in the sequence of floating point instructions singly to completion until the exception is raised again.

Claim 15. (New) The method of claim 14 wherein the inserted command compares floating point status bits at completion of a last floating point operation with an arming condition of floating point status bits before a commit command is executed.